July 27, 2017

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: In the Matter of Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, GN Docket No. 12-268; Amendment of Parts 15, 73 and 74 of the Commission's Rules to Provide for the Preservation of One Vacant Channel in the UHF Television Band for Use by White Space Devices and Wireless Microphones, MB Docket No. 15-146; Notice of *Ex Parte* Communication

Dear Ms. Dortch:

For the past several weeks, Microsoft has been engaged in a renewed campaign to convince the Commission to reserve at least one vacant channel in every market in the country for unlicensed television white spaces operations. In light of Microsoft's claims that its proposal is related to expanding rural broadband internet access service, the attached article by Harvard Law School Professor Susan Crawford is of particular interest.

The article explains that Microsoft's true motivation in expanded unlicensed operation in white spaces is not actually related to rural broadband. The article suggests that Microsoft's focus on rural broadband is solely a political strategy designed to curry favor among domestic policymakers, but that Microsoft's true intentions lie elsewhere. In particular, the article states that Microsoft seeks to leverage U.S. deployment to advance its interests in other applications, such as the Internet of Things, and in other countries.

Respectfully Submitted,

Patrick McFadden
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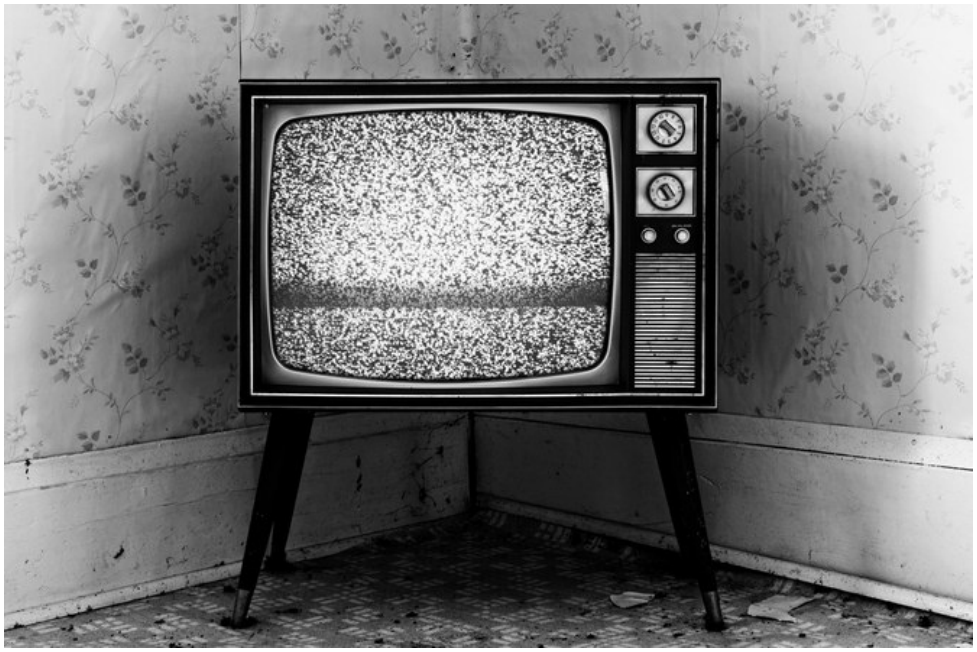
SUSAN CRAWFORD BACKCHANNEL 07.26.17 06:50 AM

MICROSOFT IS HUSTLING US WITH "WHITE SPACES"



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Microsoft recently made a Very Serious Announcement about deploying unused television airwaves to solve the digital divide in America. News outlets ate it up: "To Close Digital Divide, Microsoft to Harness Unused Television Channels," said the *New York Times* on July 10, in a headline that could have been written by the PR folks in Redmond. The *Washington Post* pegged both a really big number and a year on the plan: "Microsoft wants to bring 2 million rural Americans online by 2022," wrote Hamza Shaban and Brian Fung on July 11. I think there's another story these two newspapers missed.

BACKCHANNEL

Susan Crawford is a columnist for Backchannel and a professor at Harvard Law School. She is also the author of *The Responsive City* and *Captive Audience*.

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Microsoft's plans aren't really about consumer internet access, don't actually focus on rural areas, and aren't targeted at the US—except for political purposes. Other than that, the papers got it right.

I am a big fan of Brad Smith, Microsoft's president and chief legal officer. He is a thoughtful, long-term thinker and planner, and you can see his geopolitical mastermindery at work here.

Here's what's really going on: Microsoft is aiming to be the soup-to-nuts provider of Internet of Things devices, software, and consulting services to zillions of local and national governments around the world. Need to use energy more efficiently, manage your traffic lights, target preventative maintenance, and optimize your public transport—but you're a local government with limited resources and competence? Call Microsoft. Its entire Redmond campus is a smart city. A typical Microsoft story (this one actually written by Microsoft) : "French Cities Cut Drivers' Costs by 90 Percent with Intelligent Car-Sharing Solution," all using Microsoft technology "to connect cars, kiosks, charging stations, and a remote data center."

Now let's get behind those laudatory headlines in the *Times* and *Post*. Microsoft doesn't want to have to rely on existing mobile data carriers to execute those plans. Why? Because the carriers will want a pound of flesh—a percentage—in exchange for shipping data generated by Microsoft devices from Point A to Point B. These costs can become very substantial over zillions of devices in zillions of cities. The carriers have power because, in many places, they are the only ones allowed to use airwave frequencies—spectrum—under licenses from local governments for which they have paid hundreds of millions of dollars. To eliminate that bottleneck, it will be good to

available that can opportunistically take advantage of that spectrum.

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In the US, we already have some unlicensed spectrum, and you're probably using it right now: wifi. But it's mostly at very high frequencies, which means (particularly at the low power limits your devices are required to use when transmitting and receiving over wifi) that it doesn't go very far without fading out. This is why you have to be sitting inside a Starbucks or a McDonald's to work on your laptop: The waves don't penetrate the walls easily or travel more than about 100 feet. Traditional wifi has only limited usefulness to save Microsoft and everyone else from having to deal with the traditional wireless carriers like AT&T and Verizon. Only the carriers with licenses are allowed to transmit and receive at high power levels using lower-frequency spectrum.

For decades, the FCC has been painstakingly working at clawing away some lower-frequency spectrum from existing television broadcasters to make it available for

won't burden you. The recent update is that the Commission has finally gotten the broadcasters to make available some of their low-frequency spectrum for auction, and "repack" their operations into the narrower swaths of frequencies that their normal digital transmissions require. If you want to learn more, be my guest—I'll see you in a week or so.

Along the way, people noticed that the frequencies *between* the television channels that remained were going to be unused. That seemed like a waste. So the idea became to use those spaces—called "guard bands"—for unlicensed transmissions. The enormous success of wifi— and the billions of devices and radios that were manufactured to take advantage of wifi—was the precedent everyone cited. *Let's do it again,* was the idea—except this time, let's permit anyone to use this unlicensed spectrum between the TV bands at higher power levels so transmissions can go farther. That's the "white spaces" idea: spaces between TV channels for anyone to use.

There have been plenty of political battles over white spaces. Wireless microphone manufacturers and TV broadcasters themselves have made a ruckus about possible interference that could be caused with their operations if some of this unlicensed use bumped into their uses. And a broad coalition of those who would benefit, including Microsoft, pushed for it hard, arguing that those objections were either moot or could easily be addressed.

For a while there was an idea that devices would self-police, politely, by checking whether anyone else was using this unlicensed spectrum nearby before transmitting. But that died, and Microsoft, among others, worked steadily at creating a very-frequently-updated database to allow anyone to check what uses already existed nearby that might create a risk of interference. This took a lot of work.

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But Microsoft believes that work can pay off. Remember that Microsoft wants to serve a boatload of international markets with Internet of Things deployments that are capable of using unlicensed spectrum—including, very importantly, white spaces spectrum, in those countries. It has plans and applications going in Jamaica, Namibia, the Philippines, Tanzania, Taiwan, and Colombia, and probably many other places as well.

Microsoft won't get what it wants if it only gets other countries to give it permission to use white spaces. It is very important to Microsoft that chipsets and other elements of devices capable of transmitting and receiving across various frequencies of unlicensed spectrum be available to it at the lowest possible prices. Low prices happen only when manufacturers operate at very large scales—when there's a very large market to serve. In the white spaces arena, scale will happen only if the US white spaces plans go forward. The whole FCC process has taken so long and been so political that there's a tremendous amount of uncertainty in the market—should manufacturers go ahead and make a ton of chipsets? It's not clear.

And this is the genius of the Microsoft announcement: It is framing its pitch to hit notes the FCC wants to hear, while simultaneously accomplishing its other business goals. What issue does the Chairman of the FCC, Ajit Pai, seem genuinely committed to addressing? The rural digital divide. What does the Trump administration seem to want to push forward when it's not distracted? Infrastructure. As I've often said, existing carriers like AT&T and CenturyLink also like these messages—those carriers are the ones who will likely get any federal subsidies to build (insufficient) networks in rural areas.

So Microsoft's message machine rolls into Very Serious action. By saying that its white spaces plan is aimed at making sure that this unlicensed spectrum is used effectively in rural America, the company can (1) ally itself with the FCC's message,

in Chief somehow getting Microsoft on his radar in a way that makes life very difficult for the company (lots of corporations are trying to figure out how to get on his good side); and (3) ensure that the FCC's existing white spaces plans don't get tampered with politically. This will (4) allow the manufacturers' chipset production engines to rev up at great, US-wide scale, which will in turn (5) allow Microsoft's business plans in other countries to rely on far cheaper inputs.

It's like one of those impossible multiple bank shots you see at pool hall exhibitions. Brad Smith is The Hustler!

JASON REDMOND/GETTY IMAGES (L) AND ARCHIVE PHOTOS/GETTY IMAGES (R)

And hustled is what we will be if we believe that Microsoft's plans, by themselves, will fix America's desperate internet access problem in rural areas. You see, while using white spaces will certainly be better than nothing in rural locations, those guard bands simply aren't wide enough to allow for genuine, world-class internet data transmission to human beings in living rooms. Not possible. Not enough bandwidth. True, where commercial mobile radio (like AT&T and Verizon) isn't available at all, white spaces will definitely help. You could use it for Internet of Things applications that are very very useful, as in advanced agriculture—don't need to send much data to do that. But you would never use a white spaces transmission

even less—hundreds of times less than what people with fiber would be getting. White spaces will definitely be another arrow in the quiver used by local fixed wireless operations, but they are no kind of substitute for actual great consumer internet access in rural areas.

But in *urban* areas all around the world where Microsoft wants to do business, the white spaces will be very useful for "smart city" devices and applications—remember, that's Microsoft's big idea. And if the US is already widely using those white spaces, the rest of the world will follow along—both in terms of policy and in terms of providing additional marketplaces for the white spaces ecosystem of manufacturers to sell into.

None of this is in any way nefarious or malign. Microsoft's strategy is actually masterful. It's just not what it appears on the surface. And it is not going to fix the digital divide in America's rural areas.

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